SEQUENCE LISTING

<110> Brodeur, Bernard R.
Martin, Denis
Martin, Josee
Rioux, Clement

<120> PROTEINASE K RESISTANT SURFACE PROTEIN
OF NEISSERIA MENINGITIDIS

<130> 484112.417C1

<140> US 09/684,883
<141> 2000-10-06

<150> US 08/913,362
<151> 1997-11-13

<150> PCT/CA96/00157
<151> 1996-03-15

<150> US 60/001,983
<151> 1995-08-04

<150> US 08/406,362
<151> 1995-03-17

<160> 34

<170> FastSEQ for Windows Version 4.0

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<213> Neisseria meningitidis

<220>
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<222> (200)...(667)

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aaagaaaatt taagtataat acagcaggat tctttaacgg attcttaaca atttttctaa 120
ctgaccataa aggaaccaaa at atg aaa aaa gca ctt gcc aca ctg att gcc 172

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                                Met Lys Lys Ala Leu Ala Thr Leu Ile Ala
                                                -15                 -10

ctc gct ctc ccg gcc gcc gca ctg gcg gaa ggc gca tcc ggc ttt tac   220
Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr
                -5                  1               5

gtc caa gcc gat gcc gca cac gca aaa gcc tca agc tct tta ggt tct   268
Val Gln Ala Asp Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly Ser
        10                  15                  20

gcc aaa ggc ttc agc ccg cgc atc tcc gca ggc tac cgc atc aac gac   316
Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp
    25                  30                  35

ctc cgc ttc gcc gtc gat tac acg cgc tac aaa aac tat aaa gcc cca   364
Leu Arg Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro
40                  45                  50                  55

tcc acc gat ttc aaa ctt tac agc atc ggc gcg tcc gcc att tac gac   412
Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp
                60                  65                  70

ttc gac acc caa tcg ccc gtc aaa ccg tat ctc ggc gcg cgc ttg agc   460
Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser
            75                  80                  85

ctc aac cgc gcc tcc gtc gac ttg ggc ggc agc gac agc ttc agc caa   508
Leu Asn Arg Ala Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln
        90                  95                  100

acc tcc atc ggc ctc ggc gta ttg acg ggc gta agc tat gcc gtt acc   556
Thr Ser Ile Gly Leu Gly Val Leu Thr Gly Val Ser Tyr Ala Val Thr
    105                 110                 115

ccg aat gtc gat ttg gat gcc ggc tac cgc tac aac tac atc ggc aaa   604
Pro Asn Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys
120                 125                 130                 135

gtc aac act gtc aaa aac gtc cgt tcc ggc gaa ctg tcc gtc ggc gtg   652
Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu Leu Ser Val Gly Val
                140                 145                 150

cgc gtc aaa ttc tga tatgcgcctt attctgcaaa ccgccgagcc ttcggcggtt   707
Arg Val Lys Phe  *
            155

ttgttttctg ccaccgcaac tacacaagcc ggcggttttg tacgataatc ccgaatgctg 767
cggcttctgc cgccctattt tttgaggaat ccgaaatgtc caaaaccatc atccacaccg 827
aca                                                               830

<210> 2
<211> 174
<212> PRT
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<213> Neisseria meningitidis

<220>
<221> SIGNAL
<222> (1)...(19)

<400> 2

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Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
             1                   5                   10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
    15                  20                  25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
30                  35                  40                  45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
                50                  55                  60
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
            65                  70                  75
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
        80                  85                  90
Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Ile Gly Leu Gly
    95                  100                 105
Val Leu Thr Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
110                 115                 120                 125
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
                130                 135                 140
Val Arg Ser Gly Glu Leu Ser Val Gly Val Arg Val Lys Phe
            145                 150                 155
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<210> 3
<211> 710
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<213> Neisseria meningitidis

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<222> (116)...(172)

<220>
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<222> (173)...(643)

<400> 3

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gattctttaa cggattctta accatttttc tccctgacca taaaggaatc aagat atg  118
                                                              Met
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aaa aaa gca ctt gcc gca ctg att gcc ctc gcc ctc ccg gcc gcc gca   166
Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala Ala
            -15                 -10                 -5

ctg gcg gaa ggc gca tcc ggc ttt tac gtc caa gcc gat gcc gca cac   214
Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala His
        1               5                  10

gcc aaa gcc tca agc tct tta ggt tct gcc aaa ggc ttc agc ccg cgc   262
Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro Arg
 15                  20                  25                  30

atc tcc gca ggc tac cgc atc aac gac ctc cgc ttc gcc gtc gat tac   310
Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp Tyr
                35                  40                  45

acg cgc tac aaa aac tat aaa caa gtc cca tcc acc gat ttc aaa ctt   358
Thr Arg Tyr Lys Asn Tyr Lys Gln Val Pro Ser Thr Asp Phe Lys Leu
            50                  55                  60

tac agc atc ggc gcg tcc gcc att tac gac ttc gac acc caa tcc ccc   406
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
        65                  70                  75

gtc aaa ccg tat ctc ggc gcg cgc ttg agc ctc aac cgc gcc tcc gtc   454
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
    80                  85                  90

gac ttt aac ggc agc gac agc ttc agc caa acc tcc acc ggc ctc ggc   502
Asp Phe Asn Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu Gly
 95                  100                 105                 110

gta ttg gcg ggc gta agc tat gcc gtt acc ccg aat gtc gat ttg gat   550
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
                115                 120                 125

gcc ggc tac cgc tac aac tac atc ggc aaa gtc aac act gtc aaa aat   598
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
            130                 135                 140

gtc cgt tcc ggc gaa ctg tcc gcc ggc gta cgc gtc aaa ttc tga       643
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe  *
        145                 150                 155

tatacgcgtt attccgcaaa ccgccgagcc tttcggcggt tttgttttcc gccgccgcaa 703
ctacaca                                                           710

<210> 4
<211> 175
<212> PRT
<213> Neisseria meningitidis

<220>
<221> SIGNAL
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<222> (1)...(19)

<400> 4

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                -15                 -10                 -5
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
             1                   5                  10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
    15                  20                  25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
30                  35                  40                  45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Gln Val Pro Ser Thr Asp Phe Lys
                50                  55                  60
Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser
            65                  70                  75
Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser
        80                  85                  90
Val Asp Phe Asn Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu
    95                  100                 105
Gly Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu
110                 115                 120                 125
Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys
                130                 135                 140
Asn Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
            145                 150                 155
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<210> 5
<211> 850
<212> DNA
<213> Neisseria meningitidis

<220>
<221> CDS
<222> (208)...(732)

<220>
<221> sig_peptide
<222> (208)...(264)

<220>
<221> mat_peptide
<222> (265)...(732)

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ttgccgtcgg caaagcagcc ggataccgct acgtatcttg aagtattaaa aatattacga 120
tgcaaaaaga aaatttaagt ataataaagc agaattcttt aacggattct taacaatttt 180
tctaactgac cataaaggaa ccaaaat atg aaa aaa gca ctt gcc aca ctg att 234
                            Met Lys Lys Ala Leu Ala Thr Leu Ile
                                                -15

gcc ctc gct ctc ccg gcc gcc gca ctg gcg gaa ggc gca tcc ggc ttt   282
Ala Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe
```

```
-10                 -5                  1                  5

tac gtc caa gcc gat gcc gca cac gca aaa gcc tca agc tct tta ggt   330
Tyr Val Gln Ala Asp Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly
            10                  15                  20

tct gcc aaa ggc ttc agc ccg cgc atc tcc gca ggc tac cgc atc aac   378
Ser Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg Ile Asn
        25                  30                  35

gac ctc cgc ttc gcc gtc gat tac acg cgc tac aaa aac tat aaa gcc   426
Asp Leu Arg Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala
    40                  45                  50

cca tcc acc gat ttc aaa ctt tac agc atc ggc gcg tcc gcc att tac   474
Pro Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr
55                  60                  65                  70

gac ttc gac acc caa tcg ccc gtc aaa ccg tat ctc ggc gcg cgc ttg   522
Asp Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu
                75                  80                  85

agc ctc aac cgc gcc tcc gtc gac ttg ggc ggc agc gac agc ttc agc   570
Ser Leu Asn Arg Ala Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser
            90                  95                  100

caa acc tcc acc ggc ctc ggc gta ttg gcg ggc gta agc tat gcc gtt   618
Gln Thr Ser Thr Gly Leu Gly Val Leu Ala Gly Val Ser Tyr Ala Val
        105                 110                 115

acc ccg aat gtc gat ttg gat gcc ggc tac cgc tac aac tac atc ggc   666
Thr Pro Asn Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly
    120                 125                 130

aaa gtc aac act gtc aaa aac gtc cgt tcc ggc gaa ctg tcc gcc ggt   714
Lys Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu Leu Ser Ala Gly
135                 140                 145                 150

gtg cgc gtc aaa ttc tga tatgcgcctt attctgcaaa ccgccgagcc          762
Val Arg Val Lys Phe  *
                155

ttcggcggtt ttgttttctg ccaccgcaac tacacaagcc ggcggttttg tacgataatc 822
ccgaatgctg cggcttctgc cgccctat                                    850
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<210> 6
<211> 174
<212> PRT
<213> Neisseria meningitidis

<220>
<221> SIGNAL
<222> (1)...(19)

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Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala
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1 5 10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
15 20 25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
30 35 40 45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
50 55 60
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
65 70 75
Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
80 85 90
Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Thr Gly Leu Gly
95 100 105
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
110 115 120 125
Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
130 135 140
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
145 150 155

<210> 7
<211> 810
<212> DNA
<213> Neisseria gonorrhoeae

<220>
<221> CDS
<222> (241)...(765)

<220>
<221> sig_peptide
<222> (241)...(297)

<220>
<221> mat_peptide
<222> (298)...(765)

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gccgcgtatc ttgaggcatt gaaaatatta cgatgcaaaa agaaaatttc agtataatac 180
ggcaggattc tttaacggat tattaacaat ttttctccct gaccataaag gaaccaaaat 240
atg aaa aaa gca ctt gcc gca ctg att gcc ctc gca ctc ccg gcc gcc 288
Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala
-15 -10 -5

gca ctg gcg gaa ggc gca tcc ggc ttt tac gtc caa gcc gat gcc gca 336
Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
1 5 10

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cac gcc aaa gcc tca agc tct tta ggt tct gcc aaa ggc ttc agc ccg   384
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
     15                  20                  25

cgc atc tcc gca ggc tac cgc atc aac gac ctc cgc ttc gcc gtc gat   432
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
 30                  35                  40                  45

tac acg cgc tac aaa aac tat aaa gcc cca tcc acc gat ttc aaa ctt   480
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
                 50                  55                  60

tac agc atc ggc gcg tcc gtc att tac gac ttc gac acc caa tcg ccc   528
Tyr Ser Ile Gly Ala Ser Val Ile Tyr Asp Phe Asp Thr Gln Ser Pro
             65                  70                  75

gtc aaa ccg tat ttc ggc gcg cgc ttg agc ctc aac cgc gct tcc gcc   576
Val Lys Pro Tyr Phe Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Ala
         80                  85                  90

cac ttg ggc ggc agc gac agc ttc agc aaa acc tcc gcc ggc ctc ggc   624
His Leu Gly Gly Ser Asp Ser Phe Ser Lys Thr Ser Ala Gly Leu Gly
     95                  100                 105

gta ttg gcg ggc gta agc tat gcc gtt acc ccg aat gtc gat ttg gat   672
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
110                 115                 120                 125

gcc ggc tac cgc tac aac tac gtc ggc aaa gtc aac act gtc aaa aac   720
Ala Gly Tyr Arg Tyr Asn Tyr Val Gly Lys Val Asn Thr Val Lys Asn
                130                 135                 140

gtc cgt tcc ggc gaa ctg tcc gcc ggc gtg cgc gtc aaa ttc tga       765
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe  *
            145                 150                 155

tatacgcgtt attccgcaaa ccgccgagcc ttcggcggtt ttttg                 810
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<210> 8
<211> 174
<212> PRT
<213> Neisseria gonorrhoeae

<220>
<221> SIGNAL
<222> (1)...(19)

<400> 8

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Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
            1               5                  10
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
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```
    15                  20                  25
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
30                  35                  40                  45
Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
                50                  55                  60
Tyr Ser Ile Gly Ala Ser Val Ile Tyr Asp Phe Asp Thr Gln Ser Pro
            65                  70                  75
Val Lys Pro Tyr Phe Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Ala
        80                  85                  90
His Leu Gly Gly Ser Asp Ser Phe Ser Lys Thr Ser Ala Gly Leu Gly
    95                  100                 105
Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
110                 115                 120                 125
Ala Gly Tyr Arg Tyr Asn Tyr Val Gly Lys Val Asn Thr Val Lys Asn
                130                 135                 140
Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
            145                 150                 155
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<210> 9
<211> 16
<212> PRT
<213> Neisseria meningitidis

<400> 9
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 1   5   10   15

<210> 10
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 10
Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe
 1   5   10   15

<210> 11
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 11
Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala His Ala Lys
 1   5   10   15

<210> 12
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 12
Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly
1 5 10 15

<210> 13
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 13
Gly Ser Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg
1 5 10 15

<210> 14
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 14
Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp Tyr
1 5 10 15

<210> 15
<211> 16
<212> PRT
<213> Neisseria meningitidis

<400> 15
Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr
1 5 10 15

<210> 16
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 16
Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala
1 5 10 15

<210> 17
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 17
Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser
1 5 10 15

<210> 18
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 18
Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu
1 5 10 15

<210> 19
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 19
Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val Asp Leu Gly
1 5 10 15

<210> 20
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 20
Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Ile
1 5 10 15

<210> 21
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 21
Ser Gln Thr Ser Ile Gly Leu Gly Val Leu Thr Gly Val Ser Tyr
1 5 10 15

<210> 22
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 22
Thr Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp Ala
1 5 10 15

<210> 23
<211> 15
<212> PRT

<213> Neisseria meningitidis

<400> 23
Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val
1 5 10 15

<210> 24
<211> 15
<212> PRT
<213> Neisseria meningitidis

<400> 24
Tyr Ile Gly Lys Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu
1 5 10 15

<210> 25
<211> 14
<212> PRT
<213> Neisseria meningitidis

<400> 25
Val Arg Ser Gly Glu Leu Ser Val Gly Val Arg Val Lys Phe
1 5 10

<210> 26
<211> 25
<212> PRT
<213> Neisseria meningitidis

<400> 26
Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr
1 5 10 15
Asp Phe Lys Leu Tyr Ser Ile Gly Ala
20 25

<210> 27
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 27
taatagatct atgaaaaaag cacttgccac 30

<210> 28
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 28
attagatctt cagaatttga cgcgcac 27

<210> 29
<211> 528
<212> DNA
<213> Unknown

<220>
<223> Consensus sequence

<400> 29
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ggcgcatccg gcttttacgt ccaagccgat gccgcacacg cmaaagcctc aagctcttta 120
ggttctgcca aaggcttcag cccgcgcatc tccgcaggct accgcatcaa cgacctccgc 180
ttcgccgtcg attacacgcg ctacaaaaac tataaacaag ycccatccac cgatttcaaa 240
ctttacagca tcggcgcgtc cgycatttac gacttcgaca cccaatcscc cgtcaaaccg 300
tatytcggcg cgcgcttgag cctcaaccgc gcytccgycs actttkrrcgg cagcgacagc 360
ttcagcmaaa cctccrycgg cctcggcgta ttgrcgggcg taagctatgc cgttaccccg 420
aatgtcgatt tggatgccgg ctaccgctac aactacrtch gcaaagtcaa cactgtcaaa 480
aaygtccgtt ccggcgaact gtccgycggy gtrcgcgtca aattctga 528

<210> 30
<211> 175
<212> PRT
<213> Unknown

<220>
<223> Consensus sequence

<220>
<221> VARIANT
<222> 7, 73, 126
<223> Xaa = Any Amino Acid

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Met Lys Lys Ala Leu Ala Xaa Leu Ile Ala Leu Ala Leu Pro Ala Ala
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Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
            20   25   30
His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
        35   40   45
Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
    50   55   60
Tyr Thr Arg Tyr Lys Asn Tyr Lys Xaa Ala Pro Ser Thr Asp Phe Lys
65   70   75   80
Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser
                85   90   95
Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser
            100   105   110

```
Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Xaa Gly Leu
        115                 120                 125
Gly Val Leu Ala Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu
    130                 135                 140
Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys
145                 150                 155                 160
Asn Val Arg Ser Gly Glu Leu Ser Ala Gly Val Arg Val Lys Phe
                165                 170                 175
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<210> 31
<211> 9
<212> PRT
<213> Neisseria meningitidis

<400> 31
Glu Gly Ala Ser Gly Phe Tyr Val Gln
 1   5

<210> 32
<211> 10
<212> PRT
<213> Neisseria meningitidis

<400> 32
Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala
 1   5   10

<210> 33
<211> 19
<212> PRT
<213> Neisseria meningitidis

<400> 33
Met Lys Lys Ala Leu Ala Ala Leu Ile Ala Leu Ala Leu Pro Ala Ala
 1   5   10   15
Ala Leu Ala

<210> 34
<211> 19
<212> PRT
<213> Neisseria meningitidis

<400> 34
Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala
 1   5   10   15
Ala Leu Ala